

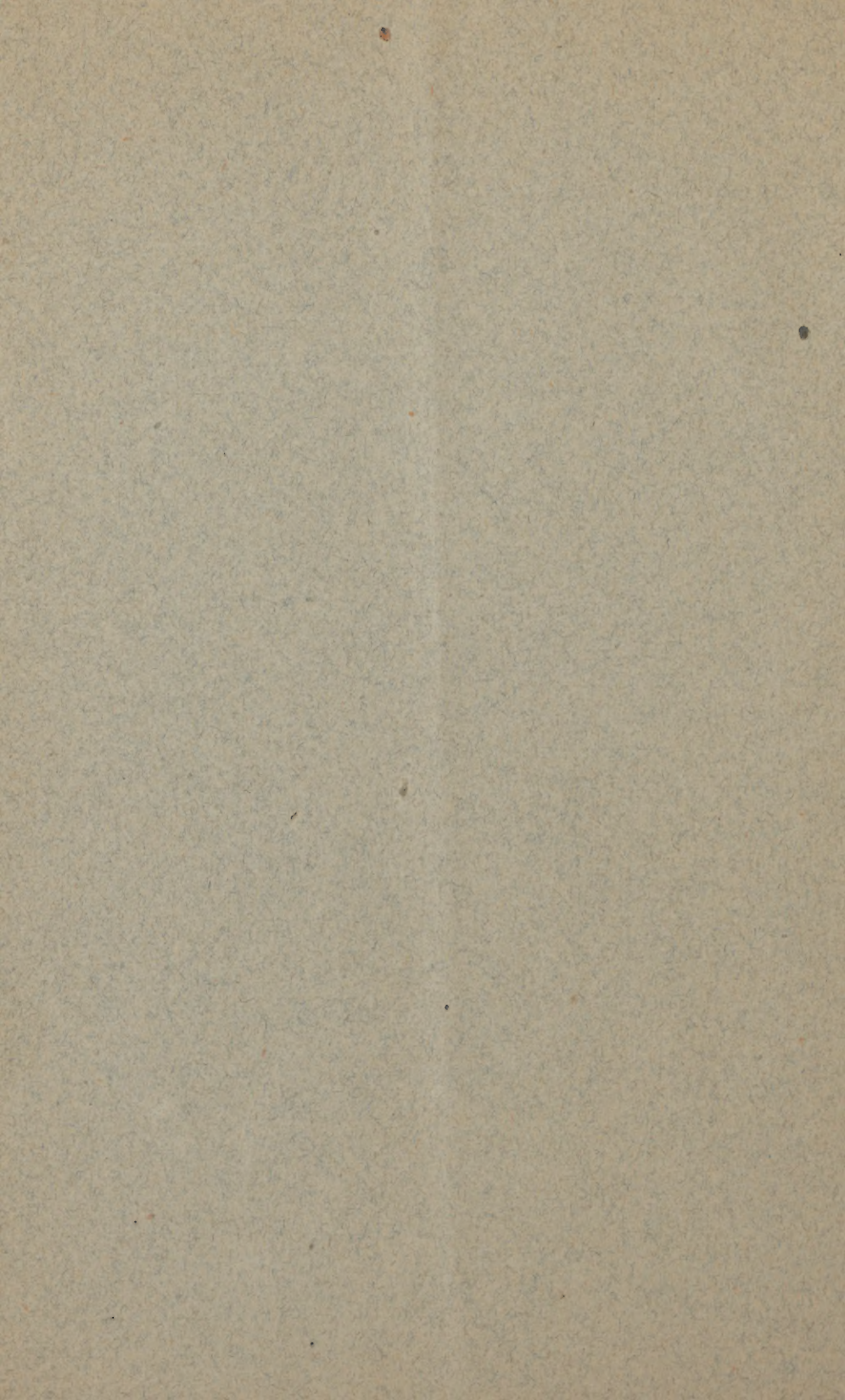
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TONSURANS

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ON "KERION CELSI," A VARIETY OF TINEA
TONSURANS.*

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SINCE Tilbury Fox, in 1866, identified the kerion (*Κηρίον*, a honeycomb), of Celsus (*De Medecinâ*, ex recensione Leonardi Targæ, etc., Neapoli, 1851, lib. v, cap. xxiii, 183), as a form of tinea tonsurans, very general interest in the disease has been awakened, though, from the comparative rarity of its occurrence, definite and exact views concerning its clinical history, pathology and therapeutics are, unfortunately, not entertained. Dubini, in Italy, accurately described the affection, under the name *vespagus del Capillizio*, but failed to recognize its parasitic nature (*Giornale Italiano della Malattie della Pelle*, 1866, p. 7). In the same country this subject has also received attention from Tanturri (*Il Morgagni*, 1871, p. 150), Maiocchi (*Gaz. Med. de Roma*, 1875, No. 5, 1875, and No. 5, 1877), Schilling (*Compend. clinico delle Malattie cutaneo*, etc., Roma, 1877), and Bardazzi (*Comment. clin. de Pisa*, 1877, p. 210). In Germany, Auspitz has added to the knowledge of kerion (*Wiener Med. Presse*, Nos. 26 and 27, 1878), while in France, no literature has been contributed. Tilbury Fox and Erasmus Wilson have supplied nearly all that has been written about kerion in the English language.

* Read before the American Dermatological Association at Newport, September 2, 1880. For discussion, see next issue.

† The third or inflammatory stage of tinea tonsurans of Bazin (*Affections cutanées parasitaires*, Paris, 1862, p. 176) cannot be considered to represent the stage now known as tinea kerion, though the processes are undoubtedly nearly related.

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The literature of this subject being thus scanty, and not treating in a broad and comprehensive spirit, the varying degrees of change to which this term "kerion" is properly applicable, I have ventured to take advantage of the opportunities my good fortune has thrown in my way of observing the evolution of this affection, its differing degrees and stages of development, and to attempt to describe its clinical features and pathological processes in such a manner as will do justice to it.

Kerion, to quote the description of Tilbury Fox (*Skin Diseases*, Am. ed., 1873, p. 445), as existing in large or small patches upon the scalp, usually shows itself in the following manner, viz.: "The hair breaks off from over a circular area of greater or less extent, when general swelling of the textures speedily follows. These swellings are tender, and they also look uneven, and feel boggy without there being pus present, and after a while a number of apparent openings give exit to a viscid discharge. They stud the surface of the patch and are inflamed follicles. The hairs are loosened and diseased, as in tinea tonsurans. There is, however, no true suppuration. The fluid discharge reminds one of the viscid juice of the mistletoe berry." "The characters of kerion," says he, again, "are, therefore: (a) General prominence of the patch; (b) its perforation with foramina—*i. e.*, the mouths of the hair-follicles; (c) the outpouring of a mucoid fluid; (d) the non-suppuration of the swelling; (e) the looseness of the hairs; (f) the after-baldness; (g) the presence of a fungus in the hairs and follicles." Fox formerly denied that this condition could result from the application of irritating remedies to the ringworm patch, but at a more recent period (*Lancet*, vol. ii, 1877, p. 644) he admitted the latter as an occasional cause.

That this definition of kerion is altogether too narrow, even in Fox's own experience, is shown by his conceding the influence of stimulating treatment in bringing it about; for the usual result of this stimulation is suppuration in the hair-follicles, with free production of pus, thus showing that the difference is one of degree and not of kind. Indeed, Erasmus Wilson, whose peculiar views concerning diseases

generally conceded to be due to parasitic fungi, prevent his admitting the parasitic nature of this affection, designated it as suppurating folliculitis of the scalp (*Skin Diseases*, Am. ed., 1865, p. 633).

"Kerion," says he, later, "may be described as acute inflammation of the hair-follicles of a limited portion of the scalp, usually a blotch of an inch in diameter, and occurring at the juvenile portion of life. Its first symptom is swelling, which increases rapidly and rises to a considerable height. The apertures of the follicles soon become enlarged and their lips tumid, and they pour out a copious exudation of a transparent or semi-purulent viscous fluid; the hairs become loosened and fall out, and then the pathognomonic character of the affection is demonstrated; a hemispherical swelling, smooth and shining, red and angry, devoid of hair, perforated all over with the gaping mouths and tumid lips of follicles, from which there issues forth a copious stream of viscous, transparent or semi-purulent fluid." "The finger applied to the tumid part detects a lax and boggy substratum, as if of a diffused subcutaneous abscess, and sometimes of considerable extent." (*Lectures on Dermatology*, 1876-7-8, p. 241.) This latter characteristic has been generally noted.

In his early observations upon this affection, Wilson described two principal varieties, depending upon distribution, *kerion confertum* and *kerion dispersum*. (*Diseases of Skin*, 7th Am. ed., 1868, p. 665.) The differences, however, are unimportant, and Mr. Wilson wisely makes no mention of such varieties in his later writings, but with equal wisdom directs attention to the importance of being prepared to encounter variations both in extent and severity.

While, however, it is not advisable to consider *kerion* as presenting well-defined variations depending upon distribution, it may be considered appropriate to divide its manifestations into acute and chronic; for while they may occur either as a sudden outbreak upon a scalp previously apparently healthy, or in patches that have been for some time previously affected with *tinea tonsurans*, the course of the affection in either case may be inactive, sluggish, non-suppurative, or,

on the other hand, active, intense, suppurative. That such a division is not purely artificial is shown by certain differences of symptomatology, pathology and therapeutics.

Where kerion becomes developed upon an old patch of *tinea tonsurans*, it usually appears quite suddenly. The hairs, having been already infiltrated with the fungus previous to the occurrence of the kerion, differ in no manner from those drawn from an ordinary ringworm patch; they are broken, frayed, permeated with spores and mycelium, these being often present in surprising numbers, particularly where the mucoid fluid from the honeycomb-like follicular openings is scanty, and apparently unmixed with pus; in other words, where the condition best corresponds to the earlier descriptions of Fox. The following case fairly represents this:

CASE I.—“May 1, 1874. Mary Moore, 9 years old, has upon her scalp, irregularly distributed, six or seven circular patches from 2 to 5 *cm.* in diameter. They first appeared about two months ago. They are now strictly circumscribed with broken hairs, scantily distributed, which may be drawn with the gentlest traction from their places. These patches are dark-red and look as if worm-eaten, numerous small orifices being present, discharging a clear, gummy fluid, and, upon pressure, a small quantity of pus. The surfaces of these patches are denuded of horny epidermis, and project above the normal line of surrounding healthy scalp in a regularly convex manner, like a watch glass. They are raw-looking and bathed in a thin deposit of gummy secretion. They are very tender to pressure and boggy.” The hairs drawn from these patches exhibited abundantly the spores and mycelium of *trichophyton* as in ordinary *tinea tonsurans*. According to the history, at no time had the process been more acute than at the time of my observations. Other children in the house (a charitable institution) had, at the time, ringworm of the head or of the body. The use of a solution of sulphurous acid wash caused the patches in the course of two months to sink to the normal level and even below it. Slight redness and desquamation persisted, but no fungus. No signs of the reappearance of healthy hairs were visible.

Such, then, being the characters of *tinea kerion* as ordinarily described, it is difficult to imagine that a fungus

capable of exciting this irritation, may not, under certain circumstances, cause a higher grade of inflammation. We know, in fact, that active stimulation of a spot affected by the fungus may cause violent inflammation with free supuration; indeed, in tinea sycosis, to produce the same result the trichophyton is alone sufficient, the necessary concomitant conditions being present in the depth to which the fungus may penetrate, and the laxity of the connective tissue in which the hairs lie embedded. It is only reasonable, therefore, to suppose that the descriptions prevailing, of tinea kerion, can merely serve for types of a process, of which our knowledge cannot be considered complete until we can become acquainted with all its varying aspects. The study of the following case will serve to show some clinical and pathological relations of the process, and as prefatory to the consideration of more or less widely varying forms.

CASE 2.—James Hess, a pale and rather strumous boy, 7 years old, was brought to me by his mother, February 9, 1880. Ten days previously his mother had noticed upon his vertex, nearly in the median line, a scaly spot which was then nearly as large as the present limits of disease. The only disturbance it occasioned was itching. Upon the 5th, it began to swell, to become painful, to form matter, and the general appearance grew rapidly worse, until I saw him. His hair had been cut, but no treatment whatever had been practised. The patch was as large as a silver dollar. Its margins were well defined and the surface was convex and lumpy. The hairs remained in considerable quantity, but at the orifice of each follicle was, either a small pustule or a collection of sero-purulent or transparent gummy fluid. Where the pustules were ruptured, the sero-purulent or gummy drops either stood out upon the surface, or the hair could be seen protruding from an opening containing the fluid and much larger than normal. The general surface of the patch was irregularly marked with these openings; it was also deprived of its horny epidermis and bathed in glutinous fluid, so as to have a varnished appearance.

The hairs came out almost without sensible traction, and, on account of the swelling, seemed to come from a great depth. They brought with them considerable portions of their root-

sheaths, bathed in pus. Pressure occasioned pain and gave to the touch a sensation of semi-fluidity. On February 10th the patch remained unaltered, but outside its limits there had now appeared numerous little pustules. These arose from a perfectly smooth, healthy-looking skin, and were always perforated by one, sometimes two, hairs. There was no appearance of desquamation. The pustules were discrete, and did not extend further than 1 *cm.* beyond the kerion patch. The hairs perforating them could be drawn without the slightest pain, as could likewise many hairs from the neighborhood, situated in what appeared to be healthy follicles.

Neither the hairs drawn from the kerion patch, from the peripheral pustules, nor the adjoining healthy-looking surface, presented any appearance of breaking; on the contrary, they, without exception, were whole. During the next four days the hairs from the kerion patch rapidly fell out, until baldness was complete; the follicular orifices became larger, and could be seen discharging their peculiar glutinous fluid. They varied in size from that of a pinhead to that of a mustard-seed. The color of the patch remained a livid-red. The pustules about the borders of the patch became more numerous, quite surrounding it, and the scalp upon which they were situated became reddened and slightly swollen, but without scaliness. Beyond this point the disease did not advance, but under the use of a mild carbolyzed wash, began to recede, and it was noted, February 24th, that the central patch was less swollen, but was quite bald and covered with thin, yellow crusts, while the periphery was covered with purulent scales, and showed notable loss of hair. Openings of considerable size still discharged gummy and sero-purulent fluid from the central patch. The hairs even at this time showed no macroscopic evidence of breaking or fraying. Improvement continued steadily, but my patient passed from my observation before recovery. Seen two months later, a scanty crop of hair had grown upon the patch, which appeared healthy.

I had many opportunities of examining, microscopically, a large number of hairs taken from the kerion patch, the pustules beyond it, and the adjacent parts, where the only evidence of disease was in the ease with which they could be extracted. Those taken from any part of the honeycomb patch were extracted entire, and nearly always with portions of their root-sheaths adhering to them. Their free ends showed a clear, straight fracture. They were in almost every instance invaded by a bewildering growth of tricho-

phyton spores, jointed spores, and mycelium. These were densest just at the neck of the follicle, as could be seen at the torn extremity of the root-sheath. The rows of spores and mycelium could be seen to gradually decrease in abundance, and finally to disappear toward the free ends of the hairs. The same arrangement of growth could be traced along the hair and root-sheath toward the bulb, for while the median portions of the shafts were filled with a luxuriant fungous development, as the bulbs were approached, only few mycelial threads could be traced. The conclusion was irresistible that the point of invasion of the hair was where the root-sheath first came into close apposition with the hair at the neck of the follicle. From this point the fungus grew vigorously, and the spores were of large size, measuring from .006 to .007 mm. Outside of the root-sheath, and extending around the bulb, were in every instance purulent collections. These were originally separated from the hair-shaft, except where the torn sheath ceased to embrace the hair.

The contrast between the condition of these hairs and those drawn from the scalp just outside of the kerion patch was most striking. And in considering these we may include both those hairs penetrating pustules and those removed with very gentle traction but offering no naked-eye evidences of disease. In either case the hairs were extracted whole. The first noticeable difference from the hairs of the swollen patch was, that now many were extracted without a trace of root-sheath being attached to them. Under these circumstances it was commonly impossible, after the most careful search, to detect any fungus. When such was present, it was always upon the surface of the hair, and not in its substance. Where, as was usually the case, a portion of the root-sheath remained attached, the fungus could be detected in very small quantities in the sheath or upon the surface of the hair, but in that part only next to the torn end of the sheath. All other parts of the sheath were quite without fungus, and the substance of the hair was never invaded. Around the sheath, however, a larger or smaller collection of pus was invariably present, extending deeply toward the bulb. One examining the hairs without root-sheath would certainly find no fungus within them, and but very sparingly upon their surfaces. Even in the hairs [of the convex

kerion patch but very slight signs of fraying or splitting were noticeable microscopically, and it was only late in the disease that any such traces were discoverable in the hairs drawn from beyond the borders of this patch. Not one of these hairs examined early by me (numbering more than sixty) revealed the slightest sign of disintegration; all were perfect.

The examinations, begun four days after the establishment of the kerion condition, enabled me to trace the course of the invading parasite with accuracy. What the conditions are that render the presence of the trichophyton so irritating to the derma we do not know. That there are such, however, is certain. At the same time, it has been noted (Bazin, *Affections cutanées parasitaires*, Paris, 1862, p. 178, et al.) that a free secretion of pus, or the inflammation that it occasions, affords conditions inimical to the life of the fungus exposed to them, and that when such inflammatory processes arise in a patch of tinea tonsurans or sycosis, it often becomes impossible to detect the fungus that was previously so abundantly present. Indeed, some recent writers, profiting by the knowledge of this fact, have sought to make practical application of it in the treatment of intractable ringworm of the scalp, and have recommended the use of agents capable of exciting the affected patch to the necessary inflammatory action; to induce, in a word, artificial kerion. (Fox, *Lancet*, ii, 1877, p. 720; Rouquayrol, *Thèse de Paris*, 1879; Smith, *Lancet*, January 10, 1880; Cottle, *Lancet*, i, 1880, p. 482, and others.) How, now, is it possible to account for the conditions observed in the case I have mentioned? Why was fungus present in abundance in the hairs and root-sheaths drawn from the kerion patch, and why was it so scanty when looked for in the hairs drawn from the diseased area just beyond the limits of this patch? I think the explanation is as follows:

The trichophyton in seeking admission to a hair-follicle excited an unusually violent irritation, resulting in a sudden folliculitis and rapid production of pus; but not having as yet reached beyond the neck of the follicle, was destroyed more or less completely by the pus pent up within

the pustule. This condition would be represented by the more recent and more localized folliculitis around the kerion patch. When, however, the diminutive phlegmons discharged their contents, all of the spores and mycelium not having been destroyed, and the character of the inflammation having decreased in intensity, the fungus had again an opportunity to reproduce itself, the purulent parasiticide discharge having been replaced by the gummy transparent or semi-purulent fluid of the less highly inflamed kerion, which had now found a ready exit through the widely open orifices of the follicles. This, indeed, is the usual course for the affection to follow, and one most often finds the ordinary kerion patch secreting a not very copious, glutinous, non-purulent fluid, rather tending to promote than to retard the fungous growth. If, however, the inflammation had continued with unabated intensity, the fungus would have been entirely destroyed and the disease converted into a simple "suppurative folliculitis." That the affection, while preserving all the physical features of kerion, except in presenting a frankly purulent discharge capable of completely destroying the fungus, may be observed, is proven by the following case :

CASE 3.—Lizzie C., about 8 years old, an inmate of a charitable institution, had measles about the middle of February, 1877. When discharged from the infirmary toward the end of March, the nurse noticed a dryness and scaliness of the scalp. Her condition until her readmission to the infirmary, May 1st, was not noted ; but at that date, a portion of the scalp, involving the vertex and extending rather toward the left of the median line, a space equal to 10 *cm.* in diameter, was the site of a number of circular areas, varying in size from 1.5 *cm.* to 3 *cm.* They were of livid redness and moderately convex, nearly bald, the few hairs remaining becoming detached at the gentlest traction. These hairs were not broken or split. There was no desquamation. Each patch was definitely bordered by healthy skin, upon which the hairs remained firmly attached, while narrow bands of healthy skin and hairs extended in between the patches, forming a resemblance to a meshwork of unaltered scalp. At the vertex was a patch that frankly fluctuated and which, when incised, gave exit to creamy pus. This condition was reported to have

appeared suddenly, the first symptom being the sudden loss of hair in circumscribed patches. The patient had been submitted to no treatment whatever. By May 3rd, the abscess first observed was secreting freely. In addition, however, several other and smaller patches had suppurated and were discharging pus of a creamy character, from numerous minute spontaneous openings, which had resulted from suppurative inflammation along the hair follicles. At numerous other points, small pustules implanted in the skin and surrounding the hair-shafts could be seen, and it was perfectly evident that these were about to be converted into openings similar to those just described. Pressure, which occasioned excessive pain when made at certain points, caused pus to flow from several orifices at once; at other points no communications between the openings could be made out. These openings corresponded to the situations of the hair follicles and were present in great numbers in every patch. During the next few days, the patches remained of a dark-red color, very tender and painful, with very uneven and boggy convex surfaces. The epidermis was generally intact, but at the openings, which were usually of pin-head size, the course by which the horny layer was in process of being stripped off could be easily followed.

At the immediate circumference of these orifices, the combined inflammatory action and maceration in the discharges would at first occasion a small discoid area of moist and exuding raw surface, with the follicular openings always central. This process could be followed as it extended centrifugally, until several such areas would coalesce to form larger and more or less irregular surfaces of similar appearance, until the horny layer would disappear completely. The discharge was likewise becoming more serous. Improvement under treatment soon set in, and by May 16th, was very manifest. Most of the minute orifices had closed and the epidermis was quite generally restored. Tenderness was still very great, although the patches were becoming less elevated. They contrasted singularly in coloration with those parts of healthy scalp that had served to separate them from one another, giving the appearance of a peculiar mottling or marbling. Within a few days past, several new patches had appeared; they were about the size of cents, swollen, reddened and puffy, but without desquamation. Attention was first drawn to them by the sudden loss of hair. One of them was subsequently lanced; the others did not suppurate but were checked by treatment. Thenceforward

improvement was steady, and by June 20th the patient was free from disease of the scalp and had abundant fine hairs pushing out from the bald spots.

The treatment instituted at the beginning of the attack, consisted in the administration of the syrup of the iodide of iron, internally, and a dressing of carbolic acid and water, ten grains to the ounce, applied to the surface, and injected into the larger apertures.

Repeated microscopical examination of the hairs and discharges from all the patches, revealed nothing that could be positively identified as fungus. The shafts of the hairs were healthy; their fracture was smooth and there was no splitting nor fraying. Pus cells were present in abundance, and in the hair-bulbs and root-sheaths there was a peculiar granular infiltration, but no spores nor mycelium. The bulbs were spread out and flattened. Examined after immersion in chloroform, and, subsequently, in liquor potassæ, no other appearances were observed. Altogether more than fifty hairs from various situations were examined.

The foregoing case may be objected to as not properly entitled to a place in an article upon *tinea kerion*, both because of the free secretion of pus and formation of abscess that marked it, and on account of the absence of, or rather the failure to detect, the *trichophyton*. But I think there can be no doubt that the case was in nature identical with *tinea kerion*, as a few considerations will readily show.

Looked at in its clinical aspects, this affection did not present the symptoms belonging to a typical "*tinea kerion*," as this has been described for us; nor yet, since it had never been treated, could it be confounded with the results of "over-treatment" (which condition, however, as already noted, Tilbury Fox in more recent publications considered as sometimes identical with *tinea kerion*). Nevertheless, the history of the case and the concomitant symptoms were such that I am unable to recognize them as belonging to any other affection than *tinea tonsurans*. The works of no recent writer accessible to me, describe corresponding features of disease, not of parasitic origin. Erasmus Wilson, indeed, describes in the fifth edition of his work, "*On Dis-*

cases of the Skin" (Phila., 1865, p. 633), a condition certainly similar to the one I have just related, under the name of "*inflammatio folliculorum suppurans*," or "scalded head."

His well known, but generally considered erroneous, views regarding the class of vegetable parasitic skin diseases, not at all admitting the influence of a fungus in evoking the morbid action, considerably weaken the value of his descriptions of "scalded head," which certainly presents features not encountered in the non-parasitic diseases of the scalp, of other authors. In fact, in the subsequent edition of his work (7th Amr. from 6th English ed., Phila., 1868, p. 664), Wilson, identifying the affection with kerion, regards it as belonging to the group designated by most recent writers as dependent upon trichophyton.

That the fungus could not be detected in my case, is explained by the parasiticide action of the pus, resulting from the violent inflammatory action excited by the presence of the spores and mycelium at the very threshold of the follicles. Just how the fungus produced its effects is a different matter; but it is necessary to suppose, in such severe cases, that some modified, irritating quality of the fungus, or some peculiar susceptibility of the patient induces the violent reaction in the ringworm patch. At all events, it would seem advisable to include higher grades of inflammation than are usually present with kerion, such indeed as in the case I have related, and in those cases where the fungus has been destroyed by artificial stimulation; in other words, to include in the kerion stage of ringworm of the scalp not only those cases where the discharge is transparent, serous and gummy, but also those where, the other features being similar, the discharge is semi-purulent and purulent, the inflammation more intense, the formation of abscess possible. Between the two degrees, however, there is this difference: in the one case, the disease, destroying the parasite by the intensity of its own action, becomes converted into a simple inflammation, and tends toward recovery; while in the milder or typical form of kerion the life of the fungus is not destroyed, and the disease is indefinitely prolonged.

But that is not all, however: kerion, as described originally by Tilbury Fox, differed from ordinary "overtreated cases" by the absence of subcutaneous abscess, a condition often closely simulated by it, but which in point of fact is nearly always absent. It is not difficult to imagine (and the consideration of the last-described case would justify us in doing so) that, where there is such active inflammation as one meets in kerion, the formation of large deposits of pus, though not a usual result, probably in consequence of the ready exit afforded the inflammatory products, is not a very distantly related one. Indeed, I have encountered several cases where the accumulation in pockets of a mucoid or muco-purulent secretion, in the course of ringworm of the scalp, could only be accounted for by the action of an irritation similar to that producing the milder forms of kerion, since the inflammatory action was not intense. I can only attempt to explain the pathology of the process, whose clinical characters may be exemplified by the following case:

CASE 4.—Benny Bass, a slender, delicate child, 10 years old, applied for treatment at the Special Dispensary, Jan. 6, 1876. He gave the following history: He had brothers and sisters, none of whom had been affected as he was. Five months previously the hair began to fall from his scalp over a large surface, which became covered with a white powdery deposit. Some time previously this patch was raw and exuding. Other patches had also appeared since the principal one. This was about all that could be learned concerning his antecedent history. At his first visit to me his condition was as follows: There was an area almost devoid of hair, upon his scalp, over the left parietal surface posteriorly, extending a little beyond the median line. This was nearly 10 *cm.* in diameter. The surface of this patch was of a dark-red or livid color; the epidermis was continuous over it, shining and partly covered with thin large scales. There were but few hairs remaining, and these were stumpy, irregular, broken, and easily extracted. The whole patch was made irregular and lumpy by numerous fluctuating projections, very tender to pressure. The scalp itself was not thinned or threatening to open. The fluctuating projections seemed as though they had hollowed out spaces for themselves in the subcutaneous tissue.

There were no perforations along the hair-shafts, nor any gummy secretion as in ordinary kerion. The periphery of the patch was covered with ill-smelling impetiginous scabs and was sharply bounded by healthy skin and hairs. Up to this time, no treatment whatever had been practised. The impetiginous scabs at the periphery and the thin scales upon the surface were the only secretions.

Over the anterior portion of the scalp were scattered small patches of ordinary *tinea tonsurans*, and upon the right wrist a spot of *tinea circinata*. The posterior cervical glands were enlarged. An incision into one of the fluctuating points let out a gummy, mucoid fluid of a pale-straw color. Several of these pockets intercommunicated, so that they were all emptied by a few incisions. Upon the 14th, these cavities having refilled, they were reopened, and a solution of silver-nitrate, 60 grains to the ounce of distilled water, was thrown into them, and tincture of iodine was applied daily to the surface. Under this treatment improvement was steady. As recovery took place, the peculiar appearance of mottling observed in the last case, became strikingly noticeable. It was evident that this was due to the fact that parts of the diseased scalp not situated over the prominences, and which had been inflamed to a less degree, had most rapidly recovered their normal condition, while the rest remained of a dusky, red hue.

By the end of the month the scalp had been perfectly smooth and even, the patches of *tinea tonsurans* were greatly improved, and a fine suit of downy hair began to appear over the site of the former boggy ringworm. The fluid released by the lancet in the foregoing case was identical in its characters with that discharged in typical kerion, a perfectly transparent, pale straw-colored, gummy fluid, showing under the microscope only a very few scattered pus cells. The hairs drawn from the lumpy patch revealed, when examined microscopically, a disintegrated texture, the result of a thorough infiltration with the spores and mycelium of *trichophyton*.

From the history of this case, it is reasonable to suppose that the follicular orifices that probably gave exit to the exudation said to have been present in the earlier course of the complaint, became obliterated by inflammatory adhesive processes and the result of this damming up was the accumulation of the fluid in the subdermic tissue. This dis-

charge was not of an irritating nature, and reaccumulating several times after incision of the tumors, was finally checked, and the disease cured by stimulating the parts to inflammatory action of a higher degree, with formation of pus. Indeed, the fluid is, under favorable conditions, capable of reabsorption, as I have witnessed more than once, when, in the course of old and neglected and inflamed ringworm of the scalp, it has accumulated, been released by the lancet, again formed, and, subsequently, disappeared by gradual subsidence without any other treatment than such as was directed to the constitutional condition.

It remains, finally, to be noted that stages of the kerion process may be observed in ordinary irritated ringworm patches, where the reddened convex surface appears as if drawn out by a cupping-glass; while it remains dry, shining, and, as yet, without the perforations of ordinary kerion, the irritation not sufficing to induce the full symptoms of the latter condition. And in a more advanced degree, but still falling short of typical kerion, the process may be observed in cases where numerous small, dry, shining little tumors are grouped together, dark-red in color, mostly devoid of hair, but *lacking the perforations*, and though seemingly fluctuating, yielding no discharge to the lancet; conditions indicative of less violent inflammation and effusion. Dr. George H. Fox, has published such a case (Photographic Illustrations of Skin Diseases. Part ix, p. 71).

The bearing of cases such as I have related upon the question of kerion, is obvious, and serves to make clear the rationale of the artificial production of kerion for the cure of chronic and obstinate ringworm of the scalp. The condition so graphically described originally by Tilbury Fox, is so preëminently one depending for its existence solely on the action of the trichophyton, one in which the fungus may be present in such marvelous luxuriance that it is puzzling to understand how, subsequently, the same writer and others could have recommended the designed production of kerion as a method of treating tinea tonsurans. Surely, in the minds of these men, the term "kerion" can no longer convey the same signification as was originally given it.

They cannot aim at the production of a disease in which there is "no true suppuration," in which the growth of an excessive amount of fungus is still possible. Kerion, indeed, can no longer bear such a narrow interpretation, but must be understood to represent a series of changes in which the tendency is toward the formation of a "honey-comb" condition, but in which the degree of inflammation determines the nature of the discharges, whether "mucoid" and compatible with the life and growth of the fungus, or purulent and fatal to it. And if the artificial production of kerion is to become a successful method of treating ringworm of the scalp, it must be by the production of the latter condition and not the former.

I have proceeded, in the foregoing remarks, upon the assumption that kerion is always associated with the presence of trichophyton, is always a complication of tinea tonsurans. Not to imply, however, that such a result is not *possible* from other causes (indeed, the action of stimulating applications in the artificial production of kerion indicates that irritation is the essential influence); but rather concluding that the necessary conditions for irritation are present only when the fungus, in the manner peculiar to itself, has invaded the root-sheaths and sebaceous glands, and rendered these parts especially liable to inflammation. Could irritation be similarly applied in any other manner the result would probably be the same. Nevertheless, some writers consider that the condition may arise without the presence of the fungus. Wilson, although five of the fourteen cases reported by him (*op. cit.* p. 666) were associated either directly or indirectly with tinea tonsurans, in his latest utterances, considers the causes of the affection to depend upon "nutritive debility" (*Lectures on Dermatology*, 1876-77-78, p. 244). Johnathan Hutchinson (*Catalogue of New Sydenham Society's Atlas of Portraits of Diseases of the Skin*, part ii, p. 121) considers that it may be a consequence of "eczema, sycosis of the scalp and ringworm." Liveing and McCall Anderson also believe that it may occur independently of ringworm (*Diagnosis of Skin Diseases*, New York, 1879, p. 254). On the other hand, Fox, Maiocchi,

Tanturri, Schilling, and Auspitz, regard the condition as always the result of preceding tinea tonsurans, a view with which I fully concur.

It is proper to remark, however, that affections resembling the one we are discussing, in so far as they depend upon inflammation of aggregations of sebaceous and hair follicles, have been described as resulting from the ingestion of bromide of potassium, by Voisin, Veiel, Lees, Crocker, Cholmeley, and others. They are accompanied, however, by well-marked symptoms, and bear but little clinical resemblance to kerion. Lang (*Viertelj. f. Derm. u. Syph.*, 1878, p. 539) has also compared certain syphilitic infiltrations and patches of lupus erythematosus, disorders affecting congeries of sebaceous glands, with a case (reported by himself) of parasitic sycosis (which, indeed, appears to be very similar to kerion in its nature), but, clinically, the symptoms of kerion are plainly different.

It is interesting to note that kerion is usually observed in children, scrofulous or of lowered vitality.

For most that is known of the pathological anatomy of kerion, we are indebted to the labors of Maiocchi (*Gazetta Medica di Roma*, No. 5, 1877; *Annales de Dermatol.*, Tome 8, 395; *Viertelj. f. Derm. u. Syph.*, 1878, p. 477) and to Auspitz (*Wiener Med. Presse*, Nos. 26 and 27, 1878; *Viertelj. f. Derm. u. Syph.*, 1879, 403). According to Maiocchi the trichophyton is found along and within the hair-shaft, and also in the connective tissue of the follicle. The hair is often discolored, is here and there destroyed and surrounded with pus; the root-sheath filled with epithelial cells, pus corpuscles, spores, and mycelial threads. The sebaceous glands and neighboring corium are inflamed. The interpapillary epidermis and the papillæ are hypertrophied. In every case the cavity of the abscess corresponds to a follicle.

Maiocchi thinks that the trichophyton, finding lodgment in the horny epidermis, produces ordinary tinea tonsurans; but when the root-sheath, the hair follicle, or the rete-malpighii become invaded, tinea kerion, the furuncular form, is produced. Auspitz agrees essentially with Maiocchi, excepting that he does not mention the presence of the fungus

in the follicular connective tissue, but rather in and about the hair sheath. He could detect no sign of the fungus in particles of epidermis cut from the site of the patches.

The statement of Maiocchi, that the fungus penetrates to the corium, should be received with caution, in view of the recent microscopic investigations into the condition of the skin in tinea tonsurans, by Taylor (*Lancet*, Nov. 16, 1878), Hoggan (*Lancet*, Dec. 28, 1878), and Thin (*Lancet*, March 30, 1878). These writers never succeeded in detecting the fungus except in epidermal tissues.

The suggestion of Lang (Über eine seltenere Form der parasitären Sykosis und einige entzündliche Geschwülste. *Viertelj. f. Derm. u. Syph.*, 1878, 393, who describes a case of parasitic sycosis closely agreeing in physical character with typical kerion) that in such cases the appearances are principally due to an inflammatory enlargement of the sebaceous follicles, and that the peculiar softness of the tumors is to be accounted for by the comparative absence of inflammation of the neighboring connective tissue, is of importance in considering the pathology of this affection, and, in a measure, justifies the view I entertain, that in these cases the mucoid secretion is a result of a purely catarrhal inflammation of the hair and sebaceous follicles, caused by the irritation of the fungus, the deep-lying situation of the parts involved, giving the affection its peculiar features.

It must be understood that the typical, non-suppurating, glutinous form of kerion, where the fungus is abundantly present, is referred to. The condition in the more violent, more acute and suppurating forms, is different; for here the perifollicular inflammation is more extensive and the fungus is, for the most part, not discoverable in the root-sheath. I think the processes by which these results are brought about were correctly explained when commenting upon my second case. At all events we must conclude that in some way, under certain unknown conditions, the fungus, by its mere presence, is capable of exciting violent and extensive inflammation before it has passed the threshold of the hair follicle, so to speak, and that this inflammatory reaction is fatal to its life.

These considerations make plain the principles upon which the treatment of these different conditions should be based, and enable us to reconcile the paradoxical statements of some recent writers; for, to produce the "kerion of Celsus," of Fox, of Maiocchi, of Auspitz and others, to produce the fungus-cherishing kerion of the ordinary descriptions, can only remove us farther than ever from cure, can only intensify the disease. While to stimulate the patch to active suppurative inflammation, is to destroy the exciting cause of the original disease, to produce a simple, deep-seated perifollicular, phlegmonous inflammation, the subsequent treatment of which should be conducted upon simple principles. Thus it becomes possible to comprehend the apparently contradictory directions for treatment, calling in one breath for epilation and mild parasiticide applications, and in the next for croton oil and other remedies capable of exciting the most violent inflammations.

In conclusion, then, tinea kerion is an affection of the scalp, comparable to parasitic sycosis, depending always for its origin upon trichophyton tonsurans, and unfrequently observed. The ordinary descriptions of it cannot be considered as portraying more than one of the stages of the morbid process; the one usually observed, it is true, but which entirely fails to give correct impressions of the whole series of changes. At one end of this series may be arranged those conditions resulting from deep-seated follicular inflammation, and characterized in its mildest form by lumpy, livid, boggy, semi-fluctuating elevations of the affected surface, tender to pressure, and dotted here and there with pustules developed around the hairshafts. Incisions into these elevations release only bloody serum or blood. In the more advanced form we have the condition to which the term kerion has been usually applied. Here the elevations are perforated by openings corresponding to the orifices of the hair follicles, through which the viscid transparent or semi-purulent glutinous fluid exudes in considerable quantity, giving the patch (now either raw and secreting, "like a hypertrophied tonsil," or protected for the most part by its horny epidermis) the peculiar honey-comb appearance that has given it its name. A condition that is probably a

later stage of the same process may sometimes be observed where this same fluid, not finding an exit, in consequence of an adhesive and obstructive inflammation of the follicles, collects in pockets, and may require to be released with the lancet or may ultimately undergo reabsorption. Under these circumstances the few hairs that remain in the patch are nearly always broken and split, and reveal abundant fungus, when examined microscopically, as likewise do the root-sheaths that frequently remain clinging to the extracted hair.

At the extreme end of the series we find the physical characters of the honey-comb condition, with, superadded, the evidences of severe and acute inflammation and the free production of pus. The hairs that have not been swept away by the discharge lie bathed in pus, but often unaltered in texture; fungus is nowhere visible; it has been destroyed by the inflammatory action. Between the purulent and non-purulent phases of this one pathological process there exist only the differences of degree. But these differences are sufficient to occasion important modifications in the course of the malady and in the significance of its symptoms. In the latter case we have ringworms of the scalp, *plus* the inflammatory alteration of the affected parts. In the former case the trichophyton, and consequently the ringworm has been destroyed by the violence of the inflammation, and there is left for the medical man to treat, only the inflammatory process.

In consequence of these widely different results, there has arisen diversity of opinion concerning the prognosis and treatment of kerion. The affection being considered, upon the one hand, an obstinate, chronic complaint, requiring a mild and gently parasiticide treatment; and upon the other hand, its production has been regarded as the most desirable manner of curing old and intractable tinea tonsurans surely and speedily; the former opinion having reference to the typical non-purulent kerion, the latter to the actively suppurating affection.

The divergences of opinion may thus be reconciled, and the therapeutics of the disease placed upon a rational basis.



Announcement for 1881

ARCHIVES OF DERMATOLOGY

A QUARTERLY JOURNAL OF
SKIN AND VENEREAL DISEASES

EDITED BY

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Attending Physician for Skin and Venereal Diseases at the New York Hospital, Out-Patient Department;
Late Physician to the Skin Department, Demilt Dispensary, New York, etc.

The editor takes pleasure in announcing that the office of publication of the ARCHIVES OF DERMATOLOGY has been transferred again to New York, and that every effort will be made to maintain or excel the high standard of excellence which has in former years called forth the universal commendation of the medical press in this country and in Europe.

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